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Guidelines Establishing Test Procedures for the Analysis of Pollutants; Proposed Regulations; Correction

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 136

[FRL 1323-D]

Guidelines Establishing Test Procedures for the Analysis of Pollutants

Correction

In FR Doc. 79-36871, appearing at page 69464 in the issue for Monday, December 3, 1979, Table I—*List of Approved Test Procedures* (pages 69568—69573) and Table II—*Containers, Preservation, and Holding Times* (pages 69574—69575), contained numerous printing errors. Tables I and II should have read as set forth below:

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TABLE I. LIST OF APPROVED TEST PROCEDURES

Parameter and units	Method	Reference (Page Nos.) 1974 EPA Methods	14th Ed. Standard Methods	Part 31 1975 ASTM	USGS Methods[1]	Other Approved Methods
1. Acidity, as $CaCO_3$, milligrams per liter	Electrometric end point (pH of 8.2) or phenolphthalein end point	1	273(4d)	116	40	(607)[2]
2. Alkanlinity, as $CaCO_3$ milligrams per liter	Electrometric titration (only to pH 4.5) manual or automated, or equivalent automated methods	3 5	278 -	111 -	41 -	(607)[2] -
3. Ammonia (as N), milligrams per liter	Manual distillation[3] (at pH 9.5)	-	410	-	-	-
	followed by nesslerization, titration,	159	412	237	116	(614)[2]
	electrode,	165	-	-	-	-
	automated phenolate	169	616	-	-	-
Bacteria						
4. Coliform (fecal)[4]	MPN;[5]	-	922	-	-	(132)[42]
number per 100 ml	membrane filter	-	937	-	(45)[6]	(124)[42]
5. Coliform (fecal)[4] in	MPN;[5]	-	922	-	-	-
presence of chlorine,	membrane filter [5,7]	-	928,937	-	-	-
number per 100 ml						
6. Coliform (total)[4],	MPN;[5]	-	916	-	-	(117)[42]
number per 100 ml	membrane filter	-	928	-	(35)[6]	(108)[42]
7. Coliform (total)[4] in	MPN;[5]	-	916	-	-	-
presence of chlorine,	membrane filter with enrichment	-	933	-	-	-
number per 100 ml						
8. Fecal streptococci[4],	MPN;[5]	-	943	-	-	-
number per 100 ml	membrane filter;	-	944	-	(50)[6]	(136)[42]
	plate count	-	947	-	-	(143)[42]
9. Biochemical oxygen	Winkler (Azide Modification) or	-	543	-	(50)[6]	-
demand, 5-day (BOD_5)	electrode method	-	-	-	-	(17)[9]
milligrams per liter						
10. BOD_5 Carbonaceous		-	-	-	-	(507)[28]
11. Bromide, milligrams per liter	Titrimetric, iodine-iodate	14	-	323	58	-
12. Chemical oxygen demand	Dichromate reflux	20	550	472	124	(610)[2]
(COD), milligrams per liter		-	-	-	-	(17)[9]

TABLE I. LIST OF APPROVED TEST PROCEDURES (Cont.)

Parameter and units	Method	Reference (Page Nos.) 1974 EPA Methods	14th Ed. Standard Methods	Part 31 1975 ASTM	USGS Methods[1]	Other Approved Methods
13. Chloride, milligrams per liter	Silver nitrate;	-	303	267	-	-
	mercuric nitrate; or	29	304	265	-	(615)[2]
	automated colorimetric-ferricyanide	31	613	-	(46)[10]	-
14. Chlorinated organic compounds (except pesticides), milligrams per liter	Gas chromatography[11]	-	-	-	-	-
15. Chlorine—total residual, milligrams per liter	Iodometric titration, amperometric or	-	318	-	-	-
	starch-iodine end-point;	35	322	278	-	-
	DPD colorimetric or	-	332	-	-	-
	Titrimetric methods (These last two are interim methods pending laboratory testing.)	-	329	-	-	-
16. Color, platinum cobalt units or dominant wave length, hue, luminance, purity	Colorimetric;	36	64	-	82	-
	spectrophotometric; or	39	66	-	-	-
	ADMI procedure[12]	-	-	-	-	-
17. Cyanide, total[13], milligrams per liter	Distillation followed by silver nitrate titration or pyridine pyrazolone (or barbituric acid) colorimetric	40	361	503	85	(22)[9]
18. Cyanide amenable to chlorination, milligrams per liter	Distillation followed by silver nitrate titration or pyridine pyrazolone (or barbituric acid) colorimetric	49	376	503	-	-
19. Dissolved oxygen, milligrams per liter	Winkler (Azide modification) or	51	443	368	126	(609)[2]
	electrode method	56	450	-	-	-
20. Fluoride, milligrams per liter	Distillation[3] followed by	-	389	-	-	-
	ion electrode;	65	391	307	93	-
	SPADNS; or	59	393	305	-	-
	automated complexone	61	614	-	-	-
21. Hardness—total, as $CaCO_3$, milligrams per liter	EDTA titration;	68	202	161	94	(617)[2]
	automated colorimetric; or	70	-	-	-	-
	atomic absorption (sum of Ca and Mg as their respective carbonates)	-	-	-	-	-

TABLE I. LIST OF APPROVED TEST PROCEDURES (Cont.)

Parameter and units	Method	Reference (Page Nos.) 1974 EPA Methods	14th Ed. Standard Methods	Part 31 1975 ASTM	USGS Methods[1]	Other Approved Methods
22. Hydrogen ion (pH), pH units	Electrometric measurement	239	460	178	129	(606)[2]
23. Kjeldahl nitrogen (as N), milligrams per liter	Digestion and distillation followed by nesslerization, titration, or	175	437	-	122	(612)[2]
	electrode;	165	-	-	-	-
	automated digestion automated phenolate	182	-	-	-	-
Metals						
24. Aluminum—total, milligrams per liter	Digestion[14] followed by	92	152	-	(19)[10]	-
	atomic absorption[15] or by					
	colorimetric (Eriochrome Cyanide R)	-	171	-	-	-
	or by ICP[27]	-	-	-	-	-
25. Aluminum—dissolved, milligrams per liter	0.45 micron filtration[16] followed by referenced methods for total aluminum					
26. Antimony—total, milligrams per liter	Digestion[14] followed by atomic absorption[15]	94	-	-	-	-
27. Antimony—dissolved, milligrams per liter	0.45 micron filtration[16] followed by referenced method for total antimony	-	-	-	-	-
28. Arsenic—total, milligrams per liter	Digestion followed by	-	285	-	-	-
	silver diethyldithiocarbamate; or	9	281	-	(31)[10]	-
	atomic absorption[15, 17]	95	159	-	(37)[10]	-
	or by ICP[27]	-	-	-	-	-
29. Arsenic—dissolved, milligrams per liter	0.45 micron filtration[16] followed by referenced method for total arsenic	-	-	-	-	-
30. Barium—total, milligrams per liter	Digestion[14] followed by atomic	97	152	-	52	-
	absorption[15] or by ICP[27]	-	-	-	-	-
31. Barium—dissolved, milligrams per liter	0.45 micron filtration[16] followed by referenced method for total barium	-	-	-	-	-
32. Beryllium—total, milligrams per liter	Digestion[14] followed by atomic	99	152	-	53	-
	absorption[15] or by colorimetric	-	177	-	-	-
	(Aluminon) or by ICP[27]	-	-	-	-	-

TABLE I. LIST OF APPROVED TEST PROCEDURES (Cont.)

Parameter and units	Method	Reference (Page Nos.) 1974 EPA Methods	14th Ed. Standard Methods	Part 31 1975 ASTM	USGS Methods[1]	Other Approved Methods
33. Beryllium—dissolved, milligrams per liter	0.45 micron filtration[16] followed by referenced method for total beryllium	-	-	-	-	-
34. Boron—total, milligrams per liter	Colorimetric (Curcumin),	13	287	-	-	-
	or by ICP[27]	-	-	-	-	-
35. Boron—dissolved, milligrams per liter	0.45 micron filtration[16] followed by referenced method for total boron	-	-	-	-	-
36. Cadmium—total milligrams per liter	Digestion[14] followed by atomic absorption[15] or by	101	148	345	62	(619)[2] (37)[9]
	colorimetric (Dithizone)		182			
	or by ICP[27]	-	-	-	-	-
37. Cadmium—dissolved, milligrams per liter	0.45 micron filtration [16] followed by referenced method for total cadmium	-	-	-	-	-
38. Calcium—total, milligrams per liter	Digestion[14] followed by atomic absorption; or	103	148	345	66	-
	EDTA titration	-	189	-	-	-
	or by ICP [27]	-	-	-	-	-
39. Calcium—dissolved, milligrams per liter	0.45 micron filtration[16] followed by referenced method for total calcium	-	-	-	-	-
40. Chromium VI, milligrams per liter	Extraction and atomic absorption;	89, 105	-	-	76	-
	colorimetric (Diphenylcarbazide)	-	192	-	75	-
41. Chromium VI—dissolved, milligrams per liter	0.45 micron filtration[16] followed by referenced method for chromium VI	-	-	-	-	-
42. Chromium—total, milligrams per liter	Digestion[14] followed by atomic absorption[15] or by	105	148	345	78	(619)[2]
	colorimetric (Diphenylcarbazide)	-	192	286	77	-
	or by ICP[27]	-	-	-	-	
43. Chromium—dissolved, milligrams per liter	0.45 micron filtration[16] followed by referenced method for total chromium	-	-	-	-	
44. Cobalt—total, milligrams per liter	Digestion [14] followed by atomic absorption[15]	107	148	345	80	(37)
	or by ICP[27]	-	-	-	-	-

TABLE I. LIST OF APPROVED TEST PROCEDURES (Cont.)

Parameter and units	Method	Reference (Page Nos.) 1974 EPA Methods	14th Ed. Standard Methods	Part 31 1975 ASTM	USGS Methods[1]	Other Approved Methods
45. Cobalt—dissolved, milligrams per liter	0.45 micron filtration[16] followed by referenced method for total cobalt	-	-	-	-	-
46. Copper—total, milligrams per liter	Digestion [14] followed by atomic absorption [15] or by	108	148	345	83	(619)[2] (37)[9]
	colorimetric (Neocuproine)	-	196	293	-	-
	or by ICP [27]	-	-	-	-	-
47. Copper—dissolved,	0.45 micron filtration [16] followed by referenced method for total copper	-	-	-	-	-
48. Gold—total, milligrams per liter	Digestion [14] followed by atomic absorption [18]	-	-	-	-	-
		-	-	-	-	-
49. Iridium—total, milligrams per liter	Digestion [14] followed by	-	-	-	-	-
	atomic absorption [18]	-	-	-	-	-
		-	-	-	-	-
50. Iron—total, milligrams per liter	Digestion [14] followed by atomic absorption [15] or by	110	148	345	102	(619)[2]
	colorimetric (Phenanthroline)	-	208	326	-	-
	or by ICP [27]	-	-	-	-	-
51. Iron—dissolved, milligrams per liter	0.45 micron filtration[16] followed by referenced method for total iron	-	-	-	-	-
52. Lead—total, milligrams per liter	Digestion [14] followed by atomic absorption [15] or by	112	148	345	105	(619)[2]
	colorimetric (Dithizone)	-	215	-	-	-
	or by ICP[27]	-	-	-	-	-
53. Lead—dissolved, milligrams per liter	0.45 micron filtration[16] followed by referenced method for total lead	-	-	-	-	-
54. Magnesium—total, milligrams per liter	Digestion[14] followed by atomic absorption; or	114	148	345	109	(619)[2]
	gravimetric	-	221	-	-	-
	or by ICP[27]	-	-	-	-	-
55. Magnesium-dissolved, milligrams per liter	0.45 micron filtration [16] followed by referenced method for total magnesium	-	-	-	-	-
56. Manganese—total, milligrams per liter	Digestion[14] followed by atomic absorption [15] or by	116	148	345	111	(619)[2]
	colorimetric (Persulfate or periodate)	-	225, 227	-	-	-
	or by ICP [27]	-	-	-	-	-

TABLE I. LIST OF APPROVED TEST PROCEDURES (Cont.)

Parameter and units	Method	Reference (Page Nos.) 1974 EPA Methods	14th Ed. Standard Methods	Part 31 1975 ASTM	USGS Methods[1]	Other Approved Methods
57. Manganese—dissolved, milligrams per liter	0.45 micron filtration [16] followed by referenced method for total manganese	-	-	-	-	-
58. Mercury—total, milligrams per liter	Flameless atomic absorption	118	156	338	(51)[10]	-
59. Mercury—dissolved, milligrams per liter	0.45 micron filtration[16] followed by referenced method for total mercury	-	-	-	-	-
60. Molybdenum—total, milligrams per liter	Digestion [14] followed by atomic absorption [15]	139	-	350	-	-
	or by ICP[27]	-	-	-	-	-
61. Molybdenum—dissolved, milligrams per liter	0.45 micron filtration[16] followed by referenced method for total molybdenum	-	-	-	-	-
62. Nickel—total, milligrams per liter	Digestion [14] followed by atomic absorption [15] or by	141	148	345	115	-
	colorimetric (Heptoxime)	-	232	-	-	-
	or by ICP [27]	-	-	-	-	-
63. Nickel—dissolved, milligrams per liter	0.45 micron filtration[16] followed by referenced method for total nickel	-	-	-	-	-
64. Osmium—total, milligrams per liter	Digestion [14] followed by atomic absorption [18]	-	-	-	-	-
65. Palladium—total, milligrams per liter	Digestion[14] followed by atomic absorption [18]	-	-	-	-	-
66. Platinum—total, milligrams per liter	Digestion [14] followed by atomic absorption [18]	-	-	-	-	-
67. Potassium—total, milligrams per liter	Digestion [14] followed by atomic absorption,	143	-	-	134	(620)[2]
	colorimetric (Cobaltinitrite), or by	-	235	-	-	-
	flame photometric	-	234	403	-	-
	or by ICP [27]	-	-	-	-	-

TABLE I. LIST OF APPROVED TEST PROCEDURES (Cont.)

Parameter and units	Method	Reference (Page Nos.) 1974 EPA Methods	14th Ed. Standard Methods	Part 31 1975 ASTM	USGS Methods[1]	Other Approved Methods
68. Potassium—dissolved, milligrams per liter	0.45 micron filtration [16] followed by referenced method for total potassium	-	-	-	-	-
69. Rhodium—total, milligrams per liter	Digestion [14] followed by atomic absorption [18]	-	-	-	-	-
70. Ruthenium—total, milligrams per liter	Digestion [14] followed by atomic absorption [18]	-	-	-	-	-
71. Selenium—total, milligrams per liter	Digestion [14] followed by atomic absorption [17, 18]	145	159	-	-	-
	or by ICP [27]	-	-	-	-	-
72. Selenium—dissolved, milligrams per liter	0.45 micron filtration [16] followed by reference method for total selenium	-	-	-	-	-
73. Silica—dissolved, miligrams per liter	0.45 micron filtration [16] followed by	274	4	398	139	-
	colorimetric (Molybdosilicate)	-	487	-	-	-
	or by ICP [27]	-	-	-	-	-
74. Silver-total [19], milligrams per liter	Digestion [14] followed by atomic absorption [15] or by	146	148	-	142	(619)[2] (37)[9]
	colorimetric (Dithizone)	-	243	4	-	-
	or by ICP [27]	-	-	-	-	-
75. Silver-dissolved [19], milligrams per liter	0.45 micron filtration [16] followed by referenced method for total silver	-	-	-	-	-
76. Sodium—total, milligrams per liter	Digestion [14] followed by atomic absorption or by	147	-	-	143	(621)[2]
	flame photometric	4	250	403	-	-
	or by ICP [27]	-	-	-	-	-
77. Sodium—dissolved, milligrams per liter	0.45 micron filtration [16] followed by referenced method for total sodium	-	-	-	-	-
78. Thallium—total, milligrams per liter	Digestion [14] followed by atomic absorption [15]	149	-	-	-	-

TABLE I. LIST OF APPROVED TEST PROCEDURES (Cont.)

Parameter and units	Method	Reference (Page Nos.) 1974 EPA Methods	14th Ed. Standard Methods	Part 31 1975 ASTM	USGS Methods[1]	Other Approved Methods
79. Thallium—dissolved, milligrams per liter	0.45 micron filtration[16] followed by referenced method for total thallium	-	-	-	-	-
80. Tin—total, milligrams per liter	Digestion[14] followed by atomic absorption[15]	150	-	-	(65)[10]	-
81. Tin—dissolved, milligrams per liter	0.45 micron filtration[16] followed by referenced method for total tin	-	-	-	-	-
82. Titanium—total, milligrams per liter	Digestion[14] followed by atomic absorption[15]	151	-	-	-	-
83. Titanium—dissolved, milligrams per liter	0.45 micron filtration[16] followed by referenced method for total titanium	-	-	-	-	-
84. Vanadium—total, milligrams per liter	Digestion[14] followed by atomic absorption[15] or by	153	152	-	-	-
	colorimetric (Gallic acid)	-	260	441	(67)[10]	-
	or by ICP[27]	-	-	-	-	-
85. Vanadium—dissolved milligrams per liter	0.45 micron filtration[16] followed by referenced method for total vanadium	-	-	-	-	-
86. Zinc—total, milligrams per liter	Digestion[14] followed by atomic absorption[15] or by	155	148	345	159	(619)[2] (37)[9]
	colorimetric (Dithizone)	-	265	-	-	-
	or by ICP[27]	-	-	-	-	-
87. Zinc—dissolved, milligrams per liter	0.45 micron filtration[16] followed by referenced method for total zinc	-	-	-	-	-
88. Nitrate (as N), milligrams per liter	Cadmium reduction	201	423	-	-	-
	brucine sulfate;	197	427	358	119	(614)[2] (28)[9]
	automated cadmium or hydrazine reduction[20]	207	620	-	-	-
89. Nitrite (as N), milligrams per liter	Manual or automated colorimetric (Diazotization)	215	434	-	121	-
90. Oil and grease, milligrams per liter	Liquid-liquid extraction with trichlorotrifluoroethane-gravimetric	229	515	-	-	-

TABLE I. LIST OF APPROVED TEST PROCEDURES (Cont.)

Parameter and units	Method	Reference (Page Nos.) 1974 EPA Methods	14th Ed. Standard Methods	Part 31 1975 ASTM	USGS Methods[1]	Other Approved Methods
91. Organic carbon, total (TOC), milligrams per liter	Combustion--infrared method[2]	236	532	467	(4)[22]	-
92. Organic nitrogen (as N), milligrams per liter	Kjeldahl nitrogen minus ammonia nitrogen	175,159	437	-	122	(612,614)[2]
Organic Compounds						
93. Acenaphthene,	GC or HPLC method (610)[38]	-	-	-	-	-
micrograms per liter	GC/MS method(625)[26]	-	-	-	-	-
94. Acenaphthylene,	GC or HPLC method (610)38	-	-	-	-	-
micrograms per liter	GC/MS method(625)[26]	-	-	-	-	-
95. Acrolein,	GC method (603)[31]	-	-	-	-	-
micrograms per liter	GC/MS, method(624)[26]	-	-	-	-	-
96. Acrylonitrile,	GC method (603)[31]	-	-	-	-	-
micrograms per liter	GC/MS, method(624)[26]	-	-	-	-	-
97. Aldrin,	GC method (608)[36]	-	-	-	-	-
micrograms per liter	GC/MS, method (625)[26]	-	-	-	-	-
98. Anthracene,	GC or HPLC method (610)[38]	-	-	-	-	-
micrograms per liter	GC/MS method (625)[26]	-	-	-	-	-
99. Benzene,	GC method (602)[30]	-	-	-	-	-
micrograms per liter	GC/MS method (624)[26]	-	-	-	-	-
100. Benzidine,	HPLC method (605)[33]	-	-	-	-	-
milligrams per liter	Oxidation-colorimetric[9]	-	-	-	-	-
micrograms per liter	GC/MS method(625)[26]	-	-	-	-	-
101. Benzo(a)anthracene,	GC or HPLC method (610)[38]	-	-	-	-	-
micrograms per liter	GC/MS, method (625)[26]	-	-	-	-	-
102. Benzo(a)pyrene,	GC or HPLC method (610)[38]	-	-	-	-	-
micrograms per liter	GC/MS method (625)[26]	-	-	-	-	-
103. Benzo(b)fluoranthene	GC or HPLC method (610)[38]	-	-	-	-	-
micrograms per liter	GC/MS method (625)[26]	-	-	-	-	-
104. Benzo(g,h,i)perylene,	GC or HPLC method (610)[38]	-	-	-	-	-
micrograms per liter	GC/MS method (625)[26]	-	-	-	-	-

TABLE 1. LIST OF APPROVED TEST PROCEDURES (Cont.)

Parameter and units	Method	Reference (Page Nos.) 1974 EPA Methods	14th Ed. Standard Methods	Part 31 1975 ASTM	USGS Methods[1]	Other Approved Methods
105. Benzo(k)fluoranthene, micrograms per liter	GC or HPLC method (610)[38]	–	–	–	–	–
	GC/MS method, (625)[26]	–	–	–	–	–
106. a-BHC, micrograms per liter	GC method (608)[36]	–	–	–	–	–
	GC/MS method (625)[26]	–	–	–	–	–
107. b-BHC, micrograms per liter	GC method (608)[36]	–	–	–	–	–
	GC/MS method (625)[26]	–	–	–	–	–
108. d-BHC, micrograms per liter	GC method (608)[36]	–	–	–	–	–
	GC/MS method (625)[26]	–	–	–	–	–
109. g-BHC micrograms per liter	GC method (608)[36]	–	–	–	–	–
	GC/MS method (625)[26]	–	–	–	–	–
110. Bis(2-chloroethyl) ether micrograms per liter	GC method (611)[39]	–	–	–	–	–
	GC/MS method (625)[26]	–	–	–	–	–
111. Bis(2-chloroethoxy) methane micrograms per liter	GC method (611)[39]	–	–	–	–	–
	GC/MS method (625)[26]	–	–	–	–	–
112. Bis(2-chloroisopropyl) ether micrograms per liter	GC method (611)[39]	–	–	–	–	–
	GC/MS method (625)[26]	–	–	–	–	–
113. Bis(2-ethylhexyl) phthalate, micrograms per liter	GC method (606)[34]	–	–	–	–	–
	GC/MS method (625)[26]	–	–	–	–	–
114. Bromodichloromethane, micrograms per liter	GC method (601)[29]	–	–	–	–	–
	GC/MS method (624)[26]	–	–	–	–	–
115. Bromoform, micrograms per liter	GC method (601)[29]	–	–	–	–	–
	GC/MS method (624)[26]	–	–	–	–	–
116. Bromomethane, micrograms per liter	GC method (601)[29]	–	–	–	–	–
	GC/MS method (624)[26]	–	–	–	–	–
117. 4-Bromophenylphenyl ether, micrograms per liter	GC method (611)[39]	–	–	–	–	–
	GC/MS method (625)[26]	–	–	–	–	–
118. Butylbenzyl phthalate, micrograms per liter	GC method (606)[34]	–	–	–	–	–
	GC/MS method (625)[26]	–	–	–	–	–
119. Carbon tetrachloride, micrograms per liter	GC method (601)[29]	–	–	–	–	–
	GC/MS method (624)[26]	–	–	–	–	–
120. Chlordane, micrograms per liter	GC method (608)[36]	–	–	–	–	–
	GC/MS method (625)[26]	–	–	–	–	–

TABLE I. LIST OF APPROVED TEST PROCEDURES (Cont.)

Parameter and units.	Method	Reference (Page Nos.) 1974 EPA Methods	14th Ed. Standard Methods	Part 31 1975 ASTM	USGS Methods[1]	Other Approved Methods
121. 4-Chloro-3-methylphenol	GC method (604)[32]	-	-	-	-	-
microgrames per liter	GC/MS method (625)[26]	-	-	-	-	-
122. Chlorobenzene,	GC methods (601)[29] (602)[30]	-	-	-	-	-
microgrames per liter	GC/MS, method (624)[26]	-	-	-	-	-
123. Chloroethane,	GC method (601)[29]	-	-	-	-	-
microgrames per liter	GC/MS, method (624)[26]	-	-	-	-	-
124. 2-Chloroethylvinyl ether	GC method (601)[29]	-	-	-	-	-
microgrames per liter	GC/MS, method (624)[26]	-	-	-	-	-
125. Chloroform,	GC method (601)[29]	-	-	-	-	-
microgrames per liter	GC/MS, method (624)[26]	-	-	-	-	-
126. Chloromethane,	GC method (601)[29]	-	-	-	-	-
microgrames per liter	GC/MS method (624)[26]	-	-	-	-	-
127. 2-Chloronaphthalene,	GC method (612)[40]	-	-	-	-	-
microgrames per liter	GC/MS method (625)[26]	-	-	-	-	-
128. 2-Chlorophenol,	GC method (604)[32]	-	-	-	-	-
microgrames per liter	GC/MS, method(625)[26]	-	-	-	-	-
129. 4-Chlorophenylphenyl ether,	GC method (611)[39]	-	-	-	-	-
microgrames per liter	GC/MS, method (625)[26]	-	-	-	-	-
130. Chrysene,	GC or HPLC method (610)[38]	-	-	-	-	-
microgrames per liter	GC/MS method (625)[26]	-	-	-	-	-
131. 4,4'-DDD	GC method (608)[36]	-	-	-	-	-
microgrames per liter	GC/MS method (625)[26]	-	-	-	-	-
132. 4,4'-DDE	GC method (608)[36]	-	-	-	-	-
microgrames per liter	GC/MS method (625)[26]	-	-	-	-	-
133. 4,4'-DDT	GC method (608)[36]	-	-	-	-	-
microgrames per liter	GC/MS method (625)[26]	-	-	-	-	-
134. Dibenzo(a,h)anthracene,	GC or HPLC method (610)[38]	-	-	-	-	-
microgrames per liter	GC/MS method (625)[26]	-	-	-	-	-
135. Dibromochloromethane,	GC method (601)[29]	-	-	-	-	-
microgrames per liter	GC/MS method (624)[26]	-	-	-	-	-
136. 1,2-Dichlorobenzene,	GC methods (601)[29] (602)[30] (612)[40]	-	-	-	-	-
microgrames per liter	GC/MS method (625)[26]	-	-	-	-	-

TABLE I.—LIST OF APPROVED TEST PROCEDURES (Cont.)

Parameter and units	Method	Reference (Page Nos.) 1974 EPA Methods	14th Ed. Standard Methods	Part 31 1975 ASTM	USGS Methods[1]	Other Approved Methods
137. 1,3-Dichlorobenzene	GC methods (601)[29] (602)[30] (612)[40]	–	–	–	–	–
micrograms per liter	GC/MS method (625)[26]	–	–	–	–	–
138. 1,4-Dichlorobenzene,	GC methods (601)[29] (602)[30] (612)[40]	–	–	–	–	–
micrograms per liter	GC/MS method (625)[26]	–	–	–	–	–
139. 3,3'-Dichlorobenzidine,	HPLC method (605)[33]	–	–	–	–	–
micrograms per liter	GC/MS method (625)[26]	–	–	–	–	–
140. Dichlorodifluoromethane	GC method (601)[29]	–	–	–	–	–
micrograms per liter						
141. 1,1- Dichloroethane	GC method (601)[29]	–	–	–	–	–
micrograms per liter	GC/MS method (624)[26]	–	–	–	–	–
142. 1,2-Dichloroethane,	GC method (601)[29]	–	–	–	–	–
micrograms per liter	GC/MS method (624)[26]	–	–	–	–	–
143. 1,1-Dichloroethene	GC method (601)[29]	–	–	–	–	–
micrograms per liter	GC/MS method (624)[26]	–	–	–	–	–
144. trans-1,2-Dichloroethene,	GC method (601)[29]	–	–	–	–	–
micrograms per liter	GC/MS method (624)[26]	–	–	–	–	–
145. 2,4-Dichlorophenol,	GC method (604)[32]	–	–	–	–	–
micrograms per liter	GC/MS method (625)[26]	–	–	–	–	–
146. 1,2-Dichloropropane,	GC method (601)[29]	–	–	–	–	–
micrograms per liter	GC/MS method (624)[26]	–	–	–	–	–
147. cis-1,3-Dichloropropene	GC method (601)[29]	–	–	–	–	–
micrograms per liter	GC/MS method (624)[26]	–	–	–	–	–
148. trans-1,3-Dichloropropene	GC method (601)[29]	–	–	–	–	–
micrograms per liter	GC/MS method (624)[26]	–	–	–	–	–
149. Dieldrin,	GC method (608)[36]	–	–	–	–	–
micrograms per liter	GC/MS method (625)[26]	–	–	–	–	–
150. Diethyl phthalate,	GC method (606)[34]	–	–	–	–	–
micrograms per liter	GC/MS method (625)[26]	–	–	–	–	–
151. 2,4-Dimethylphenol,	GC method (604)[32]	–	–	–	–	–
micrograms per liter	GC/MS method (625)[26]	–	–	–	–	–
152. Dimethyl phthalate,	GC method (606)[34]	–	–	–	–	–
micrograms per liter	GC/MS method (625)[26]	–	–	–	–	–

TABLE 1. LIST OF APPROVED TEST PROCEDURES (Cont.)

Parameter and units	Method	Reference (Page Nos.) 1974 EPA Methods	14th Ed. Standard Methods	Part 31 1975 ASTM	USGS Methods[1]	Other Approved Methods
153. Di-n-butyl phthalate, micrograms per liter	GC method (606)[34]	-	-	-	-	-
	GC/MS method (625)[26]	-	-	-	-	-
154. Di-n-octyl phthalate, micrograms per liter	GC method (606)[34]	-	-	-	-	-
	GC/MS method (625)[26]	-	-	-	-	-
155. 4,6-Dinitro-2-methylphenol, micrograms per liter	GC method (604)[32]	-	-	-	-	-
	GC/MS method (625)[26]	-	-	-	-	-
156. 2,4-Dinitrophenol, micrograms per liter	GC method (604)[32]	-	-	-	-	-
	GC/MS method (625)[26]	-	-	-	-	-
157. 2,4-Dinitrotoluene, micrograms per liter	GC method (609)[37]	-	-	-	-	-
	GC/MS method (625)[26]	-	-	-	-	-
158. 2,6-Dinitrotoluene, micrograms per liter	GC method (609)[37]	-	-	-	-	-
	GC/MS method (625)[26]	-	-	-	-	-
159. 1,2-Diphenylhydrazine, micrograms per liter	GC/MS method (625)[26]	-	-	-	-	-
160. Endosulfan I, micrograms per liter	GC method (608)[36]	-	-	-	-	-
	GC/MS method (625)[26]	-	-	-	-	-
161. Endosulfan II, micrograms per liter	GC method (608)[36]	-	-	-	-	-
	GC/MS method (625)[26]	-	-	-	-	-
162. Endosulfan sulfate, micrograms per liter	GC method (608)[36]	-	-	-	-	-
	GC/MS method (625)[26]	-	-	-	-	-
163. Endrin, micrograms per liter	GC method (608)[36]	-	-	-	-	-
	GC/MS method (625)[26]	-	-	-	-	-
164. Endrin aldehyde, micrograms per liter	GC method (608)[36]	-	-	-	-	-
	GC/MS method (625)[26]	-	-	-	-	-
165. Ethylbenzene, micrograms per liter	GC method (602)[30]	-	-	-	-	-
	GC/MS method (624)[26]	-	-	-	-	-
166. Fluoranthene, micrograms per liter	GC or HPLC method (610)[38]	-	-	-	-	-
	GC/MS method (625)[26]	-	-	-	-	-
167. Fluorene, micrograms per liter	GC or HPLC method (610)[38]	-	-	-	-	-
	GC/MS method (625)[26]	-	-	-	-	-
168. Heptachlor, micrograms per liter	GC method (608)[36]	-	-	-	-	-
	GC/MS method (625)[26]	-	-	-	-	-

TABLE I. LIST OF APPROVED TEST PROCEDURES (Cont.)

Parameter and units	Method	Reference (Page Nos.) 1974 EPA Methods	14th Ed. Standard Methods	Part 31 1975 ASTM	USGS Methods[1]	Other Approved Methods
169. Heptachlor epoxide,	GC method (608)[36]	–	–	–	–	–
micrograms per liter	GC/MS method (625)[26]	–	–	–	–	–
170. Hexachlorobenzene,	GC method (612)[40]	–	–	–	–	–
micrograms per liter	GC/MS method (625)[26]	–	–	–	–	–
171. Hexachlorobutadiene,	GC method (612)[40]	–	–	–	–	–
micrograms per liter	GC/MS method (625)[26]	–	–	–	–	–
172. Hexachlorocyclopentadiene,	GC method (612)[40]	–	–	–	–	–
micrograms per liter	GC/MS method (625)[26]	–	–	–	–	–
173. Hexachloroethane,	GC method (612)[40]	–	–	–	–	–
micrograms per liter	GC/MS method (625)[26]	–	–	–	–	–
174. Indeno(1,3,3-cd)pyrene,	GC or HPLC method (610)[38]	–	–	–	–	–
micrograms per liter	GC/MS method (625)[26]	–	–	–	–	–
175. Isophorone,	GC method (609)[37]	–	–	–	–	–
micrograms per liter	GC/MS method (625)[26]	–	–	–	–	–
176. Methylene chloride,	GC method (601)[29]	–	–	–	–	–
micrograms per liter	GC/MS method (624)[26]	–	–	–	–	–
177. Naphthalene,	GC or HPLC method (610)[38]	–	–	–	–	–
micrograms per liter	GC/MS method (625)[26]	–	–	–	–	–
178. Nitrobenzene,	GC method (609)[37]	–	–	–	–	–
micrograms per liter	GC/MS method (625)[26]	–	–	–	–	–
179. 2-Nitrophenol,	GC method (604)[32]	–	–	–	–	–
micrograms per liter	GC/MS method (625)[26]	–	–	–	–	–
180. 4-Nitrophenol,	GC method (604)[32]	–	–	–	–	–
micrograms per liter	GC/MS method (625)[26]	–	–	–	–	–
181. N-Nitrosodimethylamine,	GC method (607)[35]	–	–	–	–	–
micrograms per liter	GC/MS method (625)[26]	–	–	–	–	–
182. N-Nitrosodipropylamine,	GC method (607)[35]	–	–	–	–	–
micrograms per liter	GC/MS method (625)[26]	–	–	–	–	–
183. N-Nitrosodiphenylamine,	GC method (607)[35]	–	–	–	–	–
micrograms per liter	GC/MS method (625)[26]	–	–	–	–	–
184. PCB-1016,	GC method (608)[36]	–	–	–	–	–
micrograms per liter	GC/MS method (625)[26]	–	–	–	–	–

TABLE I. LIST OF APPROVED TEST PROCEDURES (Cont.)

Parameter and units	Method	Reference (Page Nos.) 1974 EPA Methods	14th Ed. Standard Methods	Part 31 1975 ASTM	USGS Methods[1]	Other Approved Methods
185. PCB-1221, micrograms per liter	GC method (608)[36]	-	-	-	-	-
	GC/MS method (625)[26]	-	-	-	-	-
186. PCB-1232, micrograms per liter	GC method (608)[36]	-	-	-	-	-
	GC/MS method (625)[26]	-	-	-	-	-
187. PCB-1242, micrograms per liter	GC method (608)[36]	-	-	-	-	-
	GC/MS method (625)[26]	-	-	-	-	-
188. PCB-1248, micrograms per liter	GC method (608)[36]	-	-	-	-	-
	GC/MS method (625)[26]	-	-	-	-	-
189. PCB-1254, micrograms per liter	GC method (608)[36]	-	-	-	-	-
	GC/MS method (625)[26]	-	-	-	-	-
190. PCB-1260, micrograms per liter	GC method (608)[36]	-	-	-	-	-
	GC/MS method (625)[26]	-	-	-	-	-
191. Pentachlorophenol, micrograms per liter	GC method (608)[36]	-	-	-	-	-
	GC/MS method (625)[26]	-	-	-	-	-
192. Phenanthrene, micrograms per liter	GC or HPLC method (610)[38]	-	-	-	-	-
	GC/MS method (625)[26]	-	-	-	-	-
193. Phenol, micrograms per liter	GC method (604)[32]	-	-	-	-	-
	GC/MS method (625)[26]	-	-	-	-	-
194. Pyrene, micrograms per liter	GC or HPLC method (610)[38]	-	-	-	-	-
	GC/MS method (625)[26]	-	-	-	-	-
195. 2,3,7,8-Tetrachlorodibenzo-p-dioxin micrograms per liter	GC/MS methods (613)[41] (625)[26]	-	-	-	-	-
196. 1,1,2,2-Tetrachloroethane, micrograms per liter	GC method (601)[29]	-	-	-	-	-
	GC/MS method (624)[26]	-	-	-	-	-
197. Tetrachloroethene, micrograms per liter	GC method (601)[29]	-	-	-	-	-
	GC/MS method (624)[26]	-	-	-	-	-
198. Toluene, micrograms per liter	GC method (602)[30]	-	-	-	-	-
	GC/MS method (624)[26]	-	-	-	-	-
199. Toxaphene, micrograms per liter	GC method (608)[36]	-	-	-	-	-
	GC/MS method (625)[26]	-	-	-	-	-

TABLE I. LIST OF APPROVED TEST PROCEDURES (Cont.)

Parameter and units	Method	Reference (Page Nos.) 1974 EPA Methods	14th Ed. Standard Methods	Part 31 1975 ASTM	USGS Methods[1]	Other Approved Methods
200. 1,2,4-Trichlorobenzene, micrograms per liter	GC method (612)[40]	-	-	-	-	-
	GC/MS method(625),[26]	-	-	-	-	-
201. 1,1,1-Trichloroethane, micrograms per liter	GC method (601)[29]	-	-	-	-	-
	GC/MS method(624)[26]	-	-	-	-	-
202. 1,1,2-Trichloroethane, micrograms per liter	GC method (601)[29]	-	-	-	-	-
	GC/MS method(624)[26]	-	-	-	-	-
203. Trichloroethene, micrograms per liter	GC method (601)[29]	-	-	-	-	-
	GC/MS method(624)[26]	-	-	-	-	-
204. Trichlorofluoromethane, micrograms per liter	GC method (601)[29]	-	-	-	-	-
	GC/MS method(624)[26]	-	-	-	-	-
205. 2,4,6-Trichlorophenol, micrograms per liter	GC method (604)[32]	-	-	-	-	-
	GC/MS method(625)[26]	-	-	-	-	-
206. Vinyl Chloride, micrograms per liter	GC method (601)[29]	-	-	-	-	-
	GC/MS method(624)[26]	-	-	-	-	-
207. Orthophosphate (as P), milligrams per liter	Manual or	249	481	384	131	(621)[2]
	automated ascorbic acid reduction	256	624	-	-	-
208. Pesticides, milligrams per liter	Gas chromatography[10]	-	555	529	(24)[11]	-
209. Phenols, milligrams per liter	Colorimetric, (4AAP)	241	582	545	-	-
210. Phosphorus (elemental), milligrams per liter	Gas chromatography[22]	-	-	-	-	-
211. Phosphorus, total (as P), milligrams per	Persulfate digestion followed by manual	249	476,481	-	133	(621)[2]
	or automated ascorbic acid reduction	256	624	384	-	-

TABLE I. LIST OF APPROVED TEST PROCEDURES (Cont.)

Parameter and units	Method	1974 EPA Methods	14th Ed. Standard Methods	Reference (Page Nos.) Part 31 1975 ASTM	USGS Methods[1]	Other Approved Methods
Radiological						
212. Alpha—total, pCi per liter	Proportional or scintillation	-	648	591	(75)[10] (78)[24]	-
213. Alpha—counting error, pCi per liter	Proportional or scintillation counter	-	648	594	(79)[10]	-
214. Beta—total, pCi per liter	Proportional counter	-	648	601	(75)[10] (78)[24]	-
215. Beta—counting error, pCi per liter	Proportional counter	-	648	606	(79)[10]	-
216. a) Radium—total, pCi per liter	Proportional counter	-	661	661	-	-
b) ^{226}Ra, pCi per liter	Scintillation counter	-	667	-	(81)[10]	-
Residue						
217. Total, milligrams per liter	Gravimetric, 103 to 105°C	270	91	-	-	-
218. Total dissolved (filterable), milligrams per liter	Glass fiber filtration, 180°C	266	92	-	-	-
219. Total suspended (non-filterable), milligrams per liter	Glass fiber filtration, 103 to 105°C	268	94	-	-	(537)[26]
220. Settleable, milliliters per liter or milligrams per liter	Volumetric or gravimetric	-	95	-	-	-
221. Total volatile, milligrams per liter	Gravimetric, 550°C	272	95	-	-	-

TABLE 1. LIST OF APPROVED TEST PROCEDURES (Cont.)

Parameter and units	Method	Reference (Page Nos.) 1974 EPA Methods	14th Ed. Standard Methods	Part 31 1975 ASTM	USGS Methods[1]	Other Approved Methods
222. Specific conductance, micromhos per centimeter at 25°C	Wheatstone bridge conductimetry	275	71	120	148	(606)[2]
223. Sulfate (as SO_4) milligrams per liter	Gravimetric;	-	493	424	-	(624)[2]
	turbidimetric; or	277	496	425	-	(623)[2]
	automated colorimetric (barium chloranilate)	279	-	-	-	-
224. Sulfide (as S), milligrams per liter	Titrimetric—iodine for levels greater than 1 mg per liter;	284	505	-	154	-
	Methylene blue photometric	-	503	-	-	-
225. Sulfite (as SO_3), milligrams per liter	Titrimetric, iodine-iodate	285	508	435	-	-
226. Surfactants, milligrams per liter	Colorimetric (Methylene blue)	157	800	494	(11)[22]	-
227. Temperature, degrees C	Calibrated glass or electrometric thermometer	266	125	-	(31)[25]	-
228. Turbidity, NTU	Nephelometric	295	133	223	156	-

Footnotes:

1. All page references for USGS methods unless otherwise noted are to Brown, E., Skougstad, N.W., and Fishman, M.J., "Methods for Collection and Analysis of Water Samples for Dissolved Minerals and Gases, "U.S. Geological Survey Techniques of Water-Resources Inv., book 5 ch. A1, (1970)."

2. EPA comparable method may be found on indicated page of "Official Methods of Analysis of the Association of Official Analytical Chemists" methods manual, 12th ed. (1975).

3. Manual distillation is not required if comparability data on representative effluent samples are on company file to show that this preliminary distillation step is not necessary; however, manual distillation will be required to resolve any controversies.

4. The method used must be specified.

5. The 5 tube MPN is used.

6. Slack, K.V. and others, "Methods for Collection and Analysis of Aquatic Biological and Microbiological Samples "U.S. Geological Survey Techniques of Water-Resource Inv., book 5, ch A4 (1973)."

7. Since the membrane filter technique usually yields low and variable recovery from chlorinated wastewaters, the MPN method will be required to resolve any controversies.

8. The chloromine-T oxidation-colormetric procedure for benzidine is available from the Environmental Monitoring and Support Laboratory, U.S. Environmental Protection Agency, Cincinnati,Ohio 45268

9. American National Standard on Photographic Processing Effluents, Apr. 2, 1975. Available from ANSI, 1430 Broadway, New York, N.Y. 10018.

10. Fishman, M.J. and Brown, Eugene, "Selected Methods of the U.S. Geological Survey for Analysis of Wastewaters," (1976) open-file report 76-177.

11. Procedures for pentachlorophenol, chlorinated organic compounds, and pesticides can be obtained from the Environmental Monitoring and Support Laboratory, U.S. Environmental Protection Agency, Cincinnati, Ohio 45268.

12. Color method (ADMI procedure) available from Environmental Monitoring and Support Laboratory, U.S. Environmental Protection Agency, Cincinnati, Ohio 45268.

13. For samples suspected of having thiocyanate interference, magnesium chloride is used as the digestion catalyst. In the approved test procedure for cyanides, the recommended catalysts are replaced with 20 ml of a solution of 510 g/l magnesium chloride ($MgCl_2 \cdot 6H_2O$). This substitution will eliminate thiocyanate interference for both total cyanide and cyanide amenable to chlorination measurements.

14. For the determination of total metals the sample is not filtered before processing. Because vigorous digestion procedures may result in a loss of certain metals through precipation, a less vigorous treatment is recommended as given on p. 83 (4.1.4) of "Methods for Chemical Analysis of Water and Wastes" (1974). In those instances where a more vigorous digestion is desired the procedure on p. 82 (4.1.3) should be followed. For the measurement of the noble metal series (gold, iridium, osmium, palladium, platinum, rhodium and ruthenium), an aqua regia digestion is to be substituted as follows: Transfer a representative aliquot of the well-mixed sample to a Griffin beaker and add 3 ml of concentrated redistilled HNO_3. Place the beaker on a steam bath and evaporate to dryness. Cool the beaker and cautiously add a 5 ml portion of aqua regia. (Aqua regia is prepared immediately before use by carefully adding 3 volumes of concentrated HCl to one volume of concentrated HNO_3.) Cover the beaker with a watch glass and return to the steam bath. Continue heating the covered beaker for 50 min. Remove cover and evaporate to dryness. Cool and take up the residue in a small quantity of 1:1 HCl. Wash down the beaker walls and watch glass with distilled water and filter the sample to remove silicates and other insoluble material that could clog the atomizer. Adjust the volume to some predetermined value based on the expected metal concentration. The sample is now ready for analysis.

15. As the various furnace devices (flameless AA) are essentially atomic absorption techniques, they are considered to be approved test methods. Methods of standard addition are to be followed as noted in p. 78 of "Methods for Chemical Analysis of Water and Wastes." 1974

16. Dissolved metals are defined as those constitutuents which will pass through a 0.45 μm membrane filter. A prefiltration is permissible to free the sample from larger suspended solids. Filter the sample as soon as practical after collection using the first 50 to 100 ml to rinse the filter flask. (Glass or plastic filtering apparatus are recommended to avoid possible contamination.) Discard the portion used to rinse the flask and collect the required volume of filtrate. Acidify the filtrate with 1:1 redistilled HNO_3 to a pH or 2. Normally, 3 ml of (1:1) acid per liter should be sufficient to preserve the samples.

17. See "Atomic Absorption Newsletter," vol. 13, 75 (1974). Available from Perkin-Elmer Corp., Main Ave., Norwalk, Conn. 06852

18. Method available from Environmental Monitoring and Support Laboratory, U.S. Environmental Protection Agency, Cincinnati, Ohio 45268

19. Recommended methods for the analysis of silver in industrial wastewaters at concentrations of 1 mg/l and above are inadequate where silver exists as an inorganic halide. Silver halides such as the bromide and chloride are relatively insoluble in reagents such as nitric acid but are readily soluble in an aqueous buffer of sodium thiosulfate and sodium hydroxide to a pH of 12. Therefore, for levels of silver above 1 mg/l 20 ml of sample should be diluted to 100 ml by adding 40 ml each of 2M $Na_2S_2O_3$ and 2M NaOH. Standards should be prepared in the same manner. For levels of silver below 1 mg/l the recommended method is satisfactory.

20. An automated hydrazine reduction method is available from the Environmental Monitoring and Support Laboratory, U.S. Environmental Protection Agency, Cincinnati, Ohio 45268.

21. A number of such systems manufactured by various companies are considered to be comparable in their performance. In addition, another technique, based on combustion-methane detection is also acceptable.

22. Goerlitz, D., Brown, E., "Methods for Analysis of Organic Substances in Water": U.S. Geological Survey Techniques of Water-Resources Inb., book 5, ch. A3 (1972)

23. R.F. Addison and R.G. Ackman, "Direct Determination of Elemental Phosphorus by Gas-Liquid Chromatography," "Journal of Chromatography," vol. 47, No. 3, pp. 421-426, 1970.

24. The method found on p. 75 measures only the dissolved portion while the method on p. 78 measures only suspended. Therefore, the 2 results must be added together to obtain "total".

25. Stevens, H.H., Fick, J.F., and Smoot, G.F., "Water Temperature - Influential Factors, Field Measurement and Data Presentation: U.S. Geological Survey Techniques of Water Resources Inv., book 1 (1975)."

26. EPA interim methods for analysis of organics in municipal and industrial wastewater by GC/MS purge and trap (Method 624 and methylene chloride extraction (Method 625) procedures are available from the Environmental Monitoring and Support Laboratory, U.S.E.P.A., Cincinnati, Ohio, 45268. Direct Aqueous injection is to be used in these GC/MS procedures for all compounds that exceed 1000 micrograms per liter. Dichlorodifluoromethane should be analyzed by the interim gas chromatographic method 601. For differentiation between isomeric pairs anthracene and phenanthrene, chrysene and benzo(a)anthracene, and benzo (b) fluoranthene and benzo (k) fluoranthene use method 610 of polynuclear aromatic hydrocarbons. "Interim Method for Benzidine and its Salts in Wastewater" is available from the Environmental Monitoring and Support Laboratory, U.S.E.P.A., Cincinnati, Ohio, 45268 (EMSL-CI).

27. The Inductively Coupled Plasma Optical Emission Spectrometric Method (ICP) is available from the Environmental Monitoring and Support Laboratory, U.S.E.P.A. Cincinnati, Ohio 45268 (EMSL-CI).

28. Method 507 for Carbonaceous Biochemical Oxygen Demand (BOD carbonaceous) is available from the Environmental Monitoring and Support Laboratory, U.S.E.P.A. Cincinnati, Ohio 45268 (EMSL-CI).

29. Inert gas purge, followed by gas chromatography with halide specific detection (interim method 601), available from EMSL-CI.

30. Inert gas purge followed by gas chromatography and photoionization detection (interim method 602), available from EMSL-CI.

31. Inert gas purge followed by gas chromatographic separation and detection with flame ionization detector (interim method 603), available from EMSL-CI.

32. Methylene chloride extraction, followed by gas chromatography with flame ionization or electron capture detection (interim method 604), available from EMSL-CI.

33. Chloroform extraction followed by concentration and high performance liquid chromatography (HPLC) with electrochemical detection (interim method 605), available from EMSL-CI.

34. Methylene chloride extraction followed by gas chromatography with flame ionization or electron capture detection (interim method 606), available from EMSL-CI.

35. Methylene chloride extraction followed by gas chromatography with nitrogen-phosphorous or reductive Hall detectors (interim method 607), available from EMSL-CI.

36. Methylene chloride extraction followed by gas chromatography with electron capture or halogen specific detection (interim method 608), available from EMSL-CI.

37. Methylene chloride extraction followed by exchange to toluene, gas chromatography with flame ionization detection (interim method 609), available from EMSL-CI.

38. Methylene chloride extraction followed by HPLC with fluoresence or UV detection; or gas chromatography (interim method 610), available from EMSL-CI.

39. Methylene chloride extraction followed by gas chromatography with halogen-specific detector (interim method 611), available from EMSL-CI.

40. Methylene chloride extraction followed by concentration, gas chromatography with electron capture detection (interim method 612), available from EMSL-CI.

41. Methylene chloride extraction followed by transfer to hexane and capillary column gas chromatography/mass spectometry with electron impact ionization (interim method 613), available from EMSL-CI.

42. Microbiological Methods for Monitoring the Environment (December 1978) available for the Environmental Monitoring and Support Laboratory U.S. E.P.A. Cincinnati, Ohio 45268.

TABLE II. CONTAINERS, PRESERVATION, AND HOLDING TIMES

	Measurement[a]	Container[b]	Preservative[c]	Maximum Holding Time[d]
1	Acidity	P,G	Cool, 4°C	14 days
2	Alkalinity	P,G	Cool, 4°C	14 days
3	Ammonia	P,G	Cool, 4°C H_2SO_4 to pH<2	28 days
	BACTERIA			
4-7	Coliform, fecal and total	P,G	Cool, 4°C[h] 0.008% $Na_2S_2O_3$	6 hours
8	Fecal streptococci	P,G	Cool, 4°C[h] 0.008% $Na_2S_2O_3$	6 hours
9	Biochemical oxygen demand	P,G	Cool, 4°C	48 hours
10	Biochemical oxygen demand Carbonaceous	P,G	Cool, 4°C	48 hours
11	Bromide	P,G	None required	28 days
12	Chemical oxygen demand	P,G	Cool, 4°C H_2SO_4 to pH<2	28 days
13	Chloride	P,G	None Required	28 days
14	Chlorinated organic compounds	G, teflon-lined cap	Cool, 4°C[h] 0.008% $Na_2S_2O_3$	7 days (until extraction) 30 days (after extraction)
15	Chlorine, total residual	P,G	Determined on-site	2 hours
16	Color	P,G	Cool, 4°C	48 hours
17-18	Cyanide, total and amenable to chlorination	P,G P,G	Cool, 4°C NaOH to pH>12[h] 0.008% $Na_2S_2O_3$	14 days
19	Dissolved oxygen Probe Winkler	 G bottle & top G bottle & top	 Determine on site Fix on site	 1 hour 8 hours
20	Fluoride	P	None Required	28 days
21	Hardness	P,G	HNO_3 to pH<2	6 months
22	Hydrogen ion (pH)	P,G	Determine on site	2 hours
23&92	Kjeldahl and organic nitrogen	P,G	Cool, 4°C H_2SO_4 to pH<2	28 days
	METALS[e]			
40-41	Chromium VI	P,G	Cool, 4°C	48 hours

TABLE II. CONTAINERS, PRESERVATION, AND HOLDING TIMES (cont.)

Measurement[a]		Container[b]	Preservative[c]	Maximum Holding Time[d]
58-59	Mercury	P,G	HNO_3 to pH<2 0.05% $K_2Cr_2O_7$	28 days
24-87	Metals except above	P,G	HNO_3 to pH<2	6 months
88	Nitrate	P,G	Cool, 4°C	48 hours
88(a)[i]	Nitrate-nitrite	P,G	Cool, 4°C H_2SO_4 to pH<2	28 days
89	Nitrite	P,G	Cool, 4°C	48 hours
90	Oil and Grease	G	Cool, 4°C H_2SO_4 to pH<2	28 days
91	Organic Carbon	P,G	Cool, 4°C H_2SO_4 to pH<2	28 days
93-206	ORGANIC COMPOUNDS[f]			
	Extractables (including phthalates, nitrosamines organochlorine pesticides, PCB's, nitroaromatics, isophorone, polynuclear aromatic hydrocarbons, haloethers, chlorinated hydrocarbons and TCDD)	G, teflon-lined cap	Cool, 4°C 0.008% $Na_2S_2O_3$[h]	7 days (until extraction) 30 days (after extraction)
	Extractables (phenols)	G, teflon-lined cap	Cool, 4°C H_2SO_4 to pH<2 0.008% $Na_2S_2O_3$[h]	7 days (until extraction) 30 days (after extraction)
	Purgeables (Halocarbons and Aromatics)	G, teflon-lined septum	Cool, 4°C 0.008% $Na_2S_2O_3$[h]	14 days
	Purgeables (Acrolein and Acrylonitrite)	G, teflon-lined septum	Cool, 4°C 0.008% $Na_2S_2O_3$[h]	3 days
207	Orthophosphate	P,G	Filter on site Cool, 4°C	48 hours
208	Pesticides	G, teflon-lined cap	Cool, 4°C 0.008% $Na_2S_2O_3$[h]	7 days (until extraction) 30 days (after extraction)
209	Phenols	P,G	Cool, 4°C H_2SO_4 to pH<2	28 days
210	Phosphorus (elemental)	G	Cool, 4°C	48 hours
211	Phosphorus, total	P,G	Cool, 4°C H_2SO_4 to pH<2	28 days

TABLE II. CONTAINERS, PRESERVATION, AND HOLDING TIMES (cont.)

Measurement[a]		Container[b]	Preservative[c]	Maximum Holding Time[d]
	RADIOLOGICAL			
212-216	Alpha, Beta and radium	P,G	HNO_3 to pH<2	6 months
217	Residue, total	P,G	Cool, 4°C	14 days
218	Residue, Filterable	P,G	Cool, 4°C	14 days
219	Residue, nonfilterable	P,G	Cool, 4°C	7 days
220	Residue, settleable	P,G	Cool, 4°C	7 days
221	Residue, volatile	P,G	Cool, 4°C	7 days
73	Silica	P	Cool, 4°C	28 days
222	Specific conductance	P,G	Cool, 4°C	28 days
223	Sulfate	P,G	Cool, 4°C	28 days
224	Sulfide	P,G	Cool, 4°C Zinc Acetate	28 days
225	Sulfite	P,G	Cool, 4°C	48 hours
226	Surfactants	P,G	Cool, 4°C	48 hours
227	Temperature	P,G	Determine on site	immediately
228	Turbidity	P,G	Cool, 4°C	48 hours

a Parameter numbers refer to Table I.
b Polyethylene (P) or Glass (G).
c Sample preservation should be performed immediately upon sample collection. For composite samples each aliquot should be preserved at the time of collection. When use of an automatic sampler makes impossible to preserve each aliquot, then samples may be preserved by maintaining at 4°C until compositing and sample splitting is completed.
d Samples should be analyzed as soon as possible after collection. The times listed are the maximum times that samples may be held before analysis and still considered valid. Samples may be held for longer periods only if the permittee, or monitoring laboratory, has data on file to show that the specific types of samples under study are stable for the longer time.

Some samples may not be stable for the maximum time period given in the table. A permittee, or monitoring laboratory, is obligated to hold the sample for a shorter time if knowledge exists to show this is necessary to maintain sample stability.

e Samples should be filtered immediately on-site before adding preservative for dissolved metals.
f Guidance applies to samples to be analyzed by GC, LC, or GC/MS for specific organic compounds.
g This parameter not listed in Table I.
h Should only be used in the presence of residual chlorine.
i Not available in Table I.

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